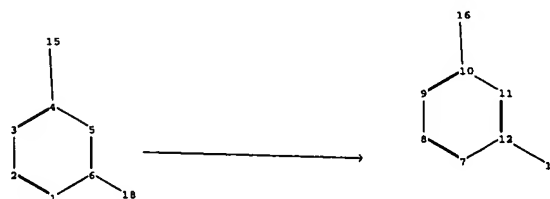
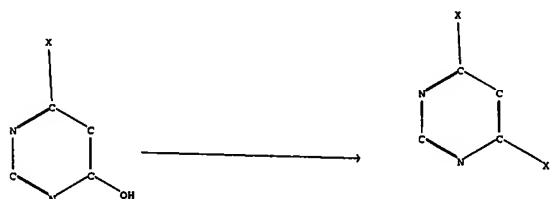


L Number	Hits	Search Text	DB	Time stamp
1	213	((544/344).CCLS.	USPAT; US-PGPUB	2003/02/10 15:13
2	1	((544/344).CCLS.) and (("4" adj chloro with "6" adj chloro\$) OR ("4" adj "6" adj dichloro\$))	USPAT; US-PGPUB	2003/02/10 15:18
3	0	((544/344).CCLS.) and (("4" adj chloro with "6" adj chloropyrim\$) OR ("4" adj "6" adj dichloropyrim\$))	USPAT; US-PGPUB	2003/02/10 15:24
4	0	((544/344).CCLS.) and (( "6" adj chloropyrim\$) OR ( "6" adj dichloropyrim\$))	USPAT; US-PGPUB	2003/02/10 15:26
5	128	((544/344).CCLS.) and ("4" with "6")	USPAT; US-PGPUB	2003/02/10 15:27
6	3	((544/344).CCLS.) and ("4" with "6" WITH \$pyrimidine)	USPAT; US-PGPUB	2003/02/10 18:30
7	1	((544/344).CCLS.) and ("4" with "6" WITH \$opyrimidine)	USPAT; US-PGPUB	2003/02/10 18:37



chain nodes :

15 16 17 18

ring nodes :

1 2 3 4 5 6 7 8 9 10 11 12

chain bonds :

4-15 6-18 10-16 12-17

ring bonds :

1-2 1-6 2-3 3-4 4-5 5-6 7-8 7-12 8-9 9-10 10-11 11-12

exact/norm bonds :

6-18

exact bonds :

4-15 10-16 12-17

normalized bonds :

1-2 1-6 2-3 3-4 4-5 5-6 7-8 7-12 8-9 9-10 10-11 11-12

Match level :

1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom 11:Atom

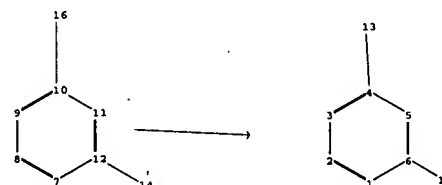
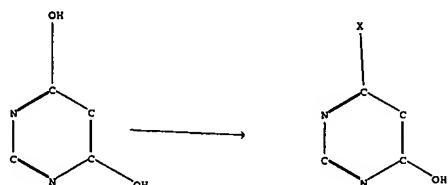
12:Atom 15:CLASS 16:CLASS 17:CLASS 18:CLASS

fragments assigned product role:

containing 7

fragments assigned reactant/reagent role:

containing 1



chain nodes :

13 14 15 16

ring nodes :

1 2 3 4 5 6 7 8 9 10 11 12

chain bonds :

4-13 6-15 10-16 12-14

ring bonds :

1-2 1-6 2-3 3-4 4-5 5-6 7-8 7-12 8-9 9-10 10-11 11-12

exact/norm bonds :

6-15 10-16 12-14

exact bonds :

4-13

normalized bonds :

1-2 1-6 2-3 3-4 4-5 5-6 7-8 7-12 8-9 9-10 10-11 11-12

Match level :

1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom 11:Atom  
12:Atom 13:CLASS 14:CLASS 15:CLASS 16:CLASS

fragments assigned product role:

containing 1

fragments assigned reactant/reagent role:

containing 7

Connecting via Winsock to STN

Welcome to STN International! Enter x:x

LOGINID:sssptal611txm

PASSWORD:

TERMINAL (ENTER 1, 2, 3, OR ?):2

\* \* \* \* \* Welcome to STN International \* \* \* \* \*

NEWS 1 Web Page URLs for STN Seminar Schedule - N. America  
NEWS 2 Apr 08 "Ask CAS" for self-help around the clock  
NEWS 3 Apr 09 BEILSTEIN: Reload and Implementation of a New Subject Area  
NEWS 4 Apr 09 ZDB will be removed from STN  
NEWS 5 Apr 19 US Patent Applications available in IFICDB, IFIPAT, and IFIUDB  
NEWS 6 Apr 22 Records from IP.com available in CAPLUS, HCAPLUS, and ZCAPLUS  
NEWS 7 Apr 22 BIOSIS Gene Names now available in TOXCENTER  
NEWS 8 Apr 22 Federal Research in Progress (FEDRIP) now available  
NEWS 9 Jun 03 New e-mail delivery for search results now available  
NEWS 10 Jun 10 MEDLINE Reload  
NEWS 11 Jun 10 PCTFULL has been reloaded  
NEWS 12 Jul 02 FOREGE no longer contains STANDARDS file segment  
NEWS 13 Jul 22 USAN to be reloaded July 28, 2002;  
saved answer sets no longer valid  
NEWS 14 Jul 29 Enhanced polymer searching in REGISTRY  
NEWS 15 Jul 30 NETFIRST to be removed from STN  
NEWS 16 Aug 08 CANCERLIT reload  
NEWS 17 Aug 08 PHARMAMarketLetter(PHARMAML) - new on STN  
NEWS 18 Aug 08 NTIS has been reloaded and enhanced  
NEWS 19 Aug 19 Aquatic Toxicity Information Retrieval (AQUIRE)  
now available on STN  
NEWS 20 Aug 19 IFIPAT, IFICDB, and IFIUDB have been reloaded  
NEWS 21 Aug 19 The MEDLINE file segment of TOXCENTER has been reloaded  
NEWS 22 Aug 26 Sequence searching in REGISTRY enhanced  
NEWS 23 Sep 03 JAPIO has been reloaded and enhanced  
NEWS 24 Sep 16 Experimental properties added to the REGISTRY file  
NEWS 25 Sep 16 CA Section Thesaurus available in CAPLUS and CA  
NEWS 26 Oct 01 CASREACT Enriched with Reactions from 1907 to 1985  
NEWS 27 Oct 21 EVENTLINE has been reloaded  
NEWS 28 Oct 24 BEILSTEIN adds new search fields  
NEWS 29 Oct 24 Nutraceuticals International (NUTRACEUT) now available on STN  
NEWS 30 Oct 25 MEDLINE SDI run of October 8, 2002  
NEWS 31 Nov 18 DKILIT has been renamed APOLLIT  
NEWS 32 Nov 25 More calculated properties added to REGISTRY  
NEWS 33 Dec 02 TIBKAT will be removed from STN  
NEWS 34 Dec 04 CSA files on STN  
NEWS 35 Dec 17 PCTFULL now covers WP/PCT Applications from 1978 to date  
NEWS 36 Dec 17 TOXCENTER enhanced with additional content  
NEWS 37 Dec 17 Adis Clinical Trials Insight now available on STN  
NEWS 38 Dec 30 ISMEC no longer available  
NEWS 39 Jan 13 Indexing added to some pre-1967 records in CA/CAPLUS  
NEWS 40 Jan 21 NUTRACEUT offering one free connect hour in February 2003  
NEWS 41 Jan 21 PHARMAML offering one free connect hour in February 2003  
NEWS 42 Jan 29 Simultaneous left and right truncation added to COMPENDEX,  
ENERGY, INSPEC

NEWS EXPRESS January 6 CURRENT WINDOWS VERSION IS V6.01a,  
CURRENT MACINTOSH VERSION IS V6.0b(ENG) AND V6.0Jb(JP),  
AND CURRENT DISCOVER FILE IS DATED 01 OCTOBER 2002

NEWS HOURS	STN Operating Hours Plus Help Desk Availability
NEWS INTER	General Internet Information
NEWS LOGIN	Welcome Banner and News Items
NEWS PHONE	Direct Dial and Telecommunication Network Access to STN
NEWS WWW	CAS World Wide Web Site (general information)

Enter NEWS followed by the item number or name to see news on that specific topic.

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\* \* \* \* \* STN Columbus \* \* \* \* \*

FILE 'HOME' ENTERED AT 15:31:17 ON 10 FEB 2003

=> file casreact  
COST IN U.S. DOLLARS

SINCE FILE ENTRY	TOTAL SESSION
0.21	0.21

FULL ESTIMATED COST

FILE 'CASREACT' ENTERED AT 15:31:27 ON 10 FEB 2003  
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FILE CONTENT:1907 - 9 Feb 2003 VOL 138 ISS 6

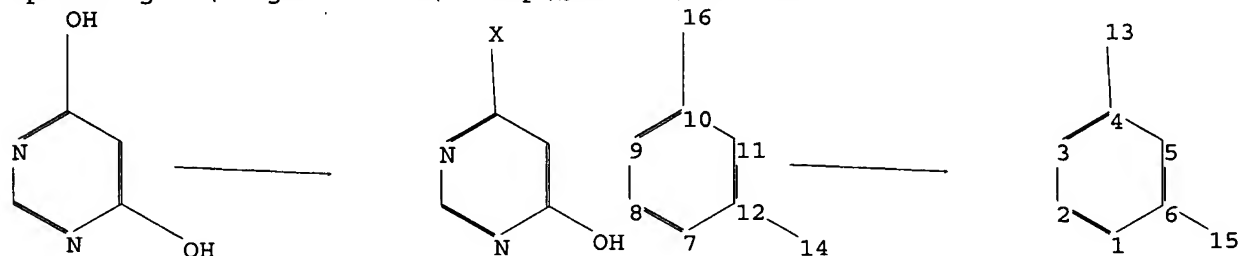
Some records from 1974 to 1991 are derived from the ZIC/VINITI data file and provided by InfoChem and some records are produced using some INPI data from the period prior to 1986.

This file contains CAS Registry Numbers for easy and accurate substance identification.

Crossover limits have been increased. See HELP RNCROSSOVER for details.

Structure search limits have been raised. See HELP SLIMIT for the new, higher limits.

=>  
Uploading C:\Program Files\Stnexp\Queries\10109093.str



chain nodes :

```

13 14 15 16
ring nodes :
1 2 3 4 5 6 7 8 9 10 11 12
chain bonds :
4-13 6-15 10-16 12-14
ring bonds :
1-2 1-6 2-3 3-4 4-5 5-6 7-8 7-12 8-9 9-10 10-11 11-12
exact/norm bonds :
6-15 10-16 12-14
exact bonds :
4-13
normalized bonds :
1-2 1-6 2-3 3-4 4-5 5-6 7-8 7-12 8-9 9-10 10-11 11-12

```

```

Match level :
1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom
11:Atom 12:Atom 13:CLASS 14:CLASS 15:CLASS 16:CLASS
fragments assigned product role:
containing 1
fragments assigned reactant/reagent role:
containing 7

```

L1        STRUCTURE UPLOADED

```

=> s l1
SAMPLE SEARCH INITIATED 15:31:49 FILE 'CASREACT'
SCREENING COMPLETE -        30 REACTIONS TO VERIFY FROM        7 DOCUMENTS

100.0% DONE        30 VERIFIED        1 HIT RXNS        1 DOCS
SEARCH TIME: 00.00.01

```

```

FULL FILE PROJECTIONS:  ONLINE  **COMPLETE**
                          BATCH  **COMPLETE**
PROJECTED VERIFICATIONS:        272 TO        928
PROJECTED ANSWERS:            1 TO        79

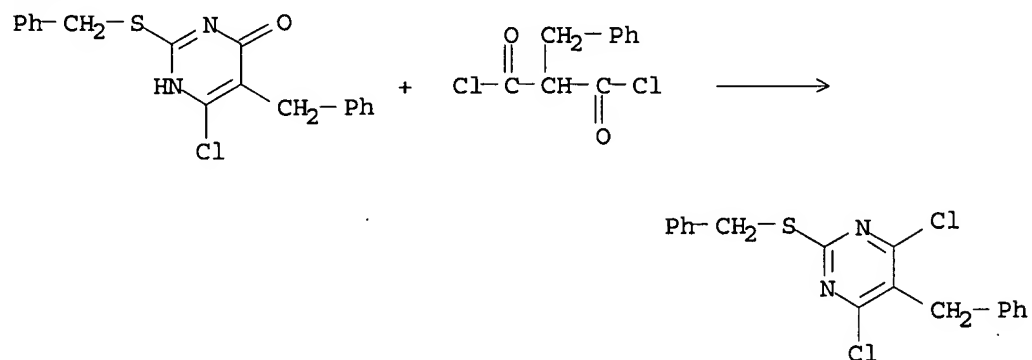
```

L2            1 SEA SSS SAM L1 (        1 REACTIONS)

=> d scan

TI Heterocyclic syntheses with malonyl chloride. Part 14. A direct synthesis of 4,6-dichloropyrimidines with 5-benzyl or -phenyl and 2-thioalkyl or -thiophenyl substituents

RX(2) OF 10



ALL ANSWERS HAVE BEEN SCANNED

=> s l1 sss full

FULL SEARCH INITIATED 15:32:49 FILE 'CASREACT'

SCREENING COMPLETE - 234 REACTIONS TO VERIFY FROM 96 DOCUMENTS

100.0% DONE 234 VERIFIED 15 HIT RXNS

10 DOCS

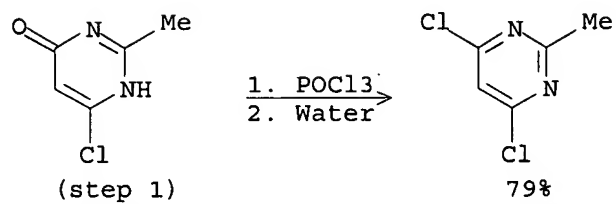
SEARCH TIME: 00.00.02

L3 10 SEA SSS FUL L1 ( 15 REACTIONS)

=> d 1-10

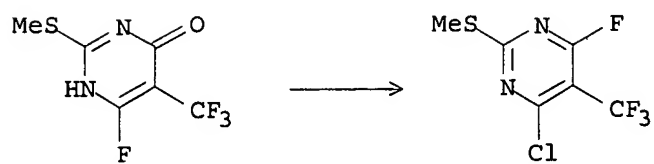


RX(1) OF 36



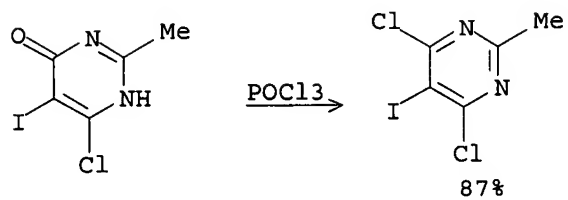
REF: Heterocyclic Communications, 5(6), 503-508; 1999

RX(1) OF 3



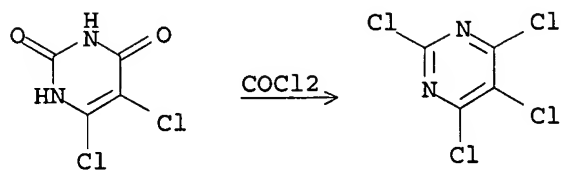
REF: Jpn. Kokai Tokkyo Koho, 62273964, 28 Nov 1987, Showa

RX(6) OF 83



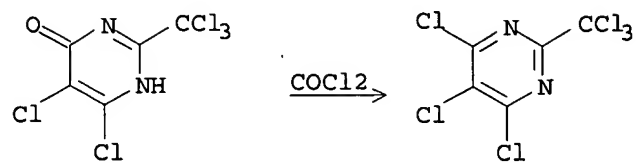
REF: Chemical & Pharmaceutical Bulletin, 34(7), 2719-24; 1986

RX(1) OF 4



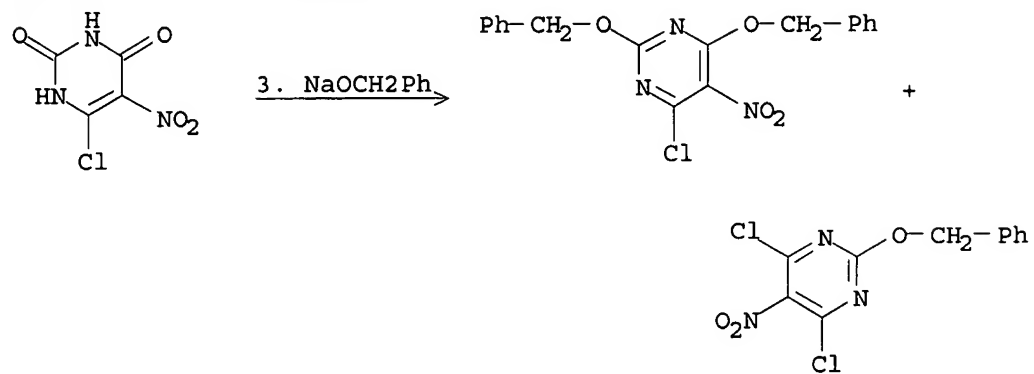
REF: Ger. Offen., 3441935, 28 May 1986

RX(1) OF 3



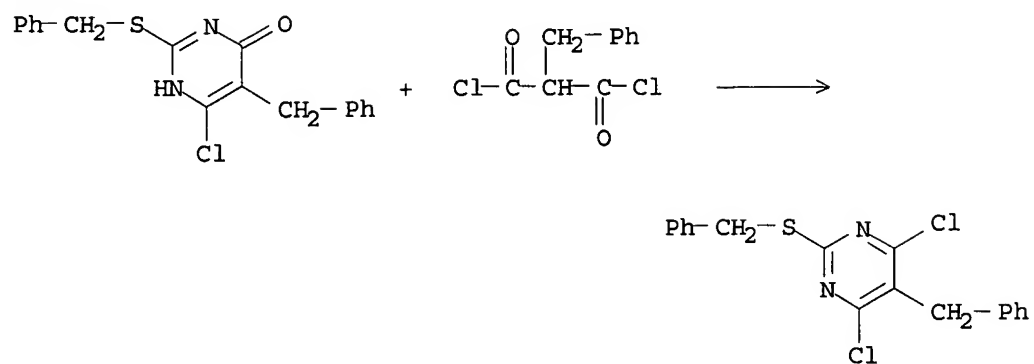
REF: Ger. Offen., 3441789, 15 May 1986

RX(73) OF 117 - 6 STEPS



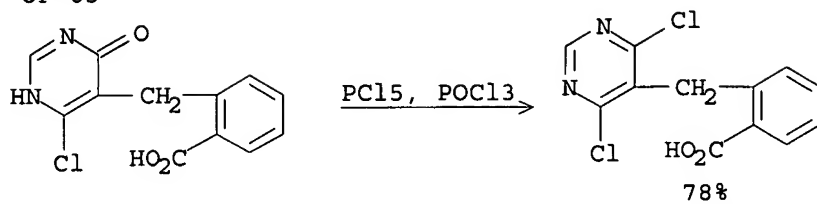
REF: Yakugaku Zasshi, 105(4), 362-7; 1985

RX(2) OF 10



REF: Journal of the Chemical Society, Perkin Transactions 1: Organic and Bio-Organic Chemistry (1972-1999), (10), 2499-503; 1982

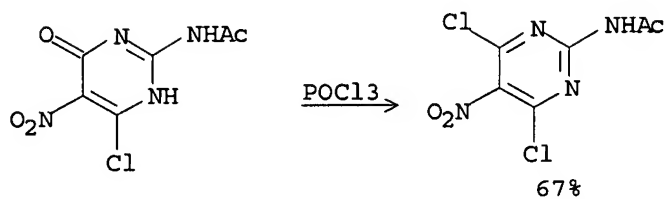
RX(13) OF 63



REF: Bulletin de la Societe Chimique de France, (1-2, Pt. 2), 92-6;  
1977

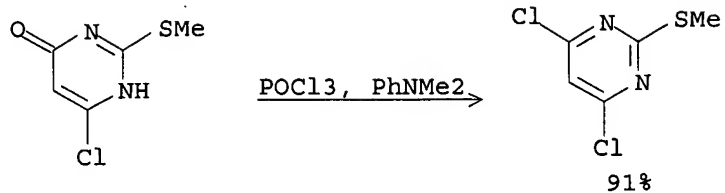


RX(1) OF 6



REF: Journal of Organic Chemistry, 40(21), 3141-2; 1975

RX(1) OF 1

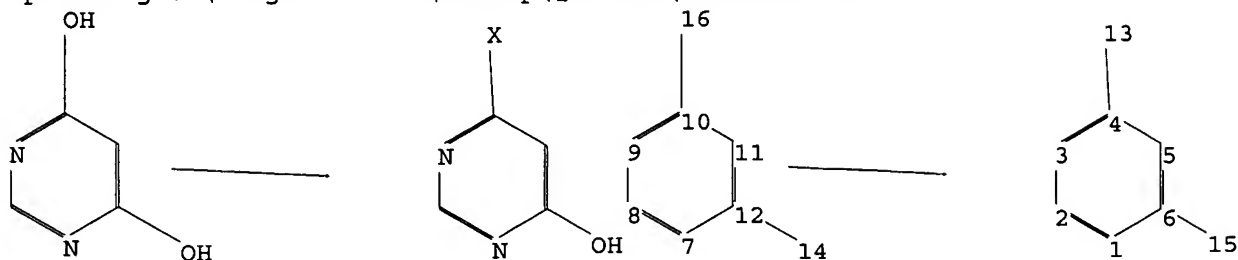


REF: J. Org. Chem., 27,, 1462-3; 1962

NOTE: Classification: Chlorination; Substitution; # Conditions: POCl<sub>3</sub>  
PhNMe<sub>2</sub>; boil 2h

=>

Uploading C:\Program Files\Stnexp\Queries\10109093.str



chain nodes :

13 14 15 16

ring nodes :

1 2 3 4 5 6 7 8 9 10 11 12

chain bonds :

4-13 6-15 10-16 12-14

ring bonds :

1-2 1-6 2-3 3-4 4-5 5-6 7-8 7-12 8-9 9-10 10-11 11-12

exact/norm bonds :

6-15 10-16 12-14

exact bonds :

4-13

normalized bonds :

1-2 1-6 2-3 3-4 4-5 5-6 7-8 7-12 8-9 9-10 10-11 11-12

Match level :

1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom

11:Atom 12:Atom 13:CLASS 14:CLASS 15:CLASS 16:CLASS

fragments assigned product role:

containing 1

fragments assigned reactant/reagent role:

containing 7

L4 STRUCTURE UPLOADED

=> s l4

SAMPLE SEARCH INITIATED 15:37:00 FILE 'CASREACT'

SCREENING COMPLETE - 0 REACTIONS TO VERIFY FROM 0 DOCUMENTS

100.0% DONE 0 VERIFIED 0 HIT RXNS 0 DOCS

SEARCH TIME: 00.00.01

FULL FILE PROJECTIONS: ONLINE \*\*COMPLETE\*\*

BATCH \*\*COMPLETE\*\*

PROJECTED VERIFICATIONS: 0 TO 0

PROJECTED ANSWERS: 0 TO 0

L5 0 SEA SSS SAM L4 ( 0 REACTIONS)

=> s l4 sss full

FULL SEARCH INITIATED 15:37:10 FILE 'CASREACT'

SCREENING COMPLETE - 32 REACTIONS TO VERIFY FROM 15 DOCUMENTS

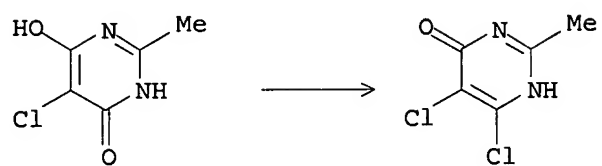
100.0% DONE 32 VERIFIED 5 HIT RXNS 3 DOCS

SEARCH TIME: 00.00.01

L6 3 SEA SSS FUL L4 ( 5 REACTIONS)

=> d 1-3

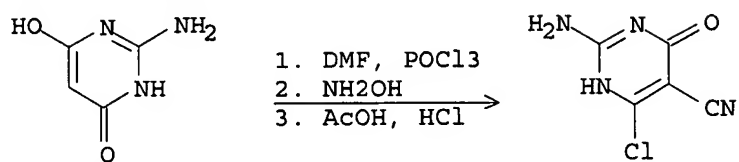
RX(63) OF 108 - 2 STEPS



REF: Journal of Medicinal Chemistry, 31(4), 814-23; 1988

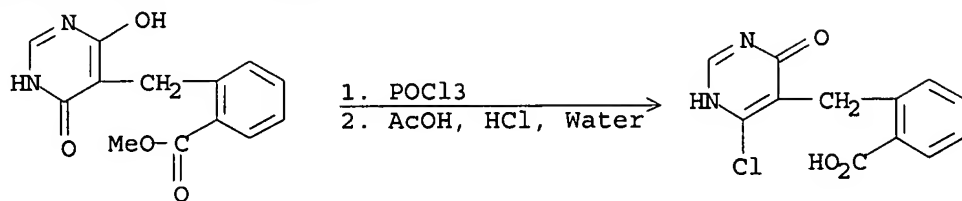
NOTE: 1) no details; ref.

RX(21) OF 38 - 3 STEPS



REF: Journal of Heterocyclic Chemistry, 20(1), 41-4; 1983

RX(28) OF 63 - 2 STEPS



REF: Bulletin de la Societe Chimique de France, (1-2, Pt. 2), 92-6;  
1977

=> file reg		
COST IN U.S. DOLLARS	SINCE FILE	TOTAL
	ENTRY	SESSION
FULL ESTIMATED COST	231.15	231.36

FILE 'REGISTRY' ENTERED AT 15:38:07 ON 10 FEB 2003  
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Property values tagged with IC are from the ZIC/VINITI data file  
 provided by InfoChem.

STRUCTURE FILE UPDATES: 7 FEB 2003 HIGHEST RN 487578-67-6  
 DICTIONARY FILE UPDATES: 7 FEB 2003 HIGHEST RN 487578-67-6

TSCA INFORMATION NOW CURRENT THROUGH MAY 20, 2002

Please note that search-term pricing does apply when  
 conducting SmartSELECT searches.

Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. See HELP  
 PROPERTIES for more information. See STNote 27, Searching Properties  
 in the CAS Registry File, for complete details:  
<http://www.cas.org/ONLINE/STN/STNOTES/stnotes27.pdf>

```
=> s c4h2cl2n2
L7          70 C4H2CL2N2

=> s l7 and 4 and 6
      12125912 4
      5588147 6
L8          31 L7 AND 4 AND 6

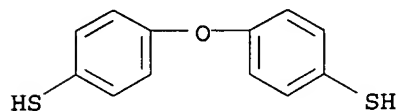
=> d 'scan
```



L8 31 ANSWERS REGISTRY COPYRIGHT 2003 ACS  
IN Benzenethiol, 4,4'-oxybis-, dilithium salt, polymer with  
3,6-dichloropyridazine (9CI)  
MF (C12 H10 O S2 . C4 H2 Cl2 N2 . 2 Li)x  
CI PMS

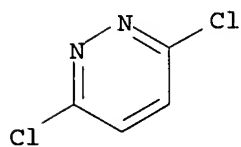
\*\*RELATED POLYMERS AVAILABLE WITH POLYLINK\*\*

CM 1



● 2 Li

CM 2



HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):0

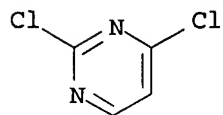
=> s l8 and pyrim?/cns

696077 PYRIM?/CNS

L9 7 L8 AND PYRIM?/CNS

=> d scan

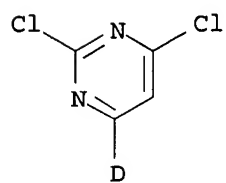
L9 7 ANSWERS REGISTRY COPYRIGHT 2003 ACS  
IN Pyrimidine, 2,4-dichloro- (7CI, 8CI, 9CI)  
MF C4 H2 Cl2 N2  
CI COM



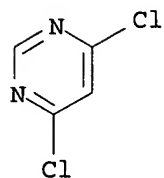
\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):6

L9 7 ANSWERS REGISTRY COPYRIGHT 2003 ACS  
IN Pyrimidine-4-d, 2,6-dichloro- (9CI)  
MF C4 H Cl2 D N2



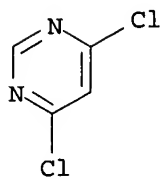
L9 7 ANSWERS REGISTRY COPYRIGHT 2003 ACS  
IN Pyrimidine, 4,6-dichloro- (7Cl, 8Cl, 9Cl)  
MF C4 H2 Cl2 N2  
CI COM



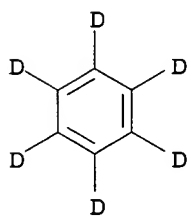
\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

L9 7 ANSWERS REGISTRY COPYRIGHT 2003 ACS  
IN Pyrimidine, 4,6-dichloro-, compd. with benzene-d6 (1:1) (9CI)  
MF C6 D6 . C4 H2 Cl2 N2

CM 1

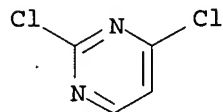


CM 2

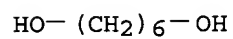


L9 7 ANSWERS REGISTRY COPYRIGHT 2003 ACS  
IN 1,6-Hexanediol, polymer with 2,4-dichloropyrimidine (9CI)  
MF (C6 H14 O2 . C4 H2 Cl2 N2)x  
CI PMS

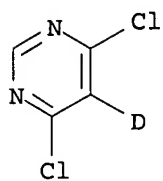
CM 1



CM 2



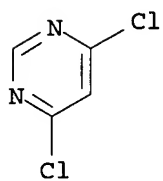
L9 7 ANSWERS REGISTRY COPYRIGHT 2003 ACS  
IN Pyrimidine-5-d, 4,6-dichloro- (9CI)  
MF C4 H C12 D N2





L9 7 ANSWERS REGISTRY COPYRIGHT 2003 ACS  
IN Pyrimidine, 4,6-dichloro-, homopolymer (9CI)  
MF (C4 H2 Cl2 N2)x  
CI PMS

CM 1



ALL ANSWERS HAVE BEEN SCANNED

=> s l9 not 2  
14848512 2  
L10 4 L9 NOT 2

=> file caplus	SINCE FILE	TOTAL
COST IN U.S. DOLLARS	ENTRY	SESSION
FULL ESTIMATED COST	23.90	255.26

FILE 'CAPLUS' ENTERED AT 15:42:36 ON 10 FEB 2003  
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FILE COVERS 1907 - 10 Feb 2003 VOL 138 ISS 7  
FILE LAST UPDATED: 9 Feb 2003 (20030209/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> s l10/prep  
219 L10  
2963997 PREP/RL  
L11 21 L10/PREP  
(L10 (L) PREP/RL)

=> d scan

L11 21 ANSWERS CAPLUS COPYRIGHT 2003 ACS  
IC ICM C07D239-30  
CC 28-16 (Heterocyclic Compounds (More Than One Hetero Atom))  
TI Preparation of 4,6-dichloropyrimidine by chlorination of  
4,6-dihydroxypyrimidine with phosphorus oxychloride.  
ST chloropyrimidine prepn; pyrimidine dichloro prepn; hydroxypyrimidine  
chlorination phosphorus oxychloride  
IT Chlorination  
(preparation of 4,6-dichloropyrimidine by chlorination of  
4,6-dihydroxypyrimidine with phosphorus oxychloride)  
IT 1193-21-1P, 4,6-Dichloropyrimidine  
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP  
(Preparation)  
(preparation of 4,6-dichloropyrimidine from 4,6-dihydroxypyrimidine)  
IT 1193-24-4, 4,6-Dihydroxypyrimidine  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(preparation of 4,6-dichloropyrimidine from 4,6-dihydroxypyrimidine)

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):0

=> file reg		
COST IN U.S. DOLLARS	SINCE FILE	TOTAL
	ENTRY	SESSION
FULL ESTIMATED COST	2.97	258.23

FILE 'REGISTRY' ENTERED AT 15:44:14 ON 10 FEB 2003  
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STRUCTURE FILE UPDATES: 7 FEB 2003 HIGHEST RN 487578-67-6  
 DICTIONARY FILE UPDATES: 7 FEB 2003 HIGHEST RN 487578-67-6

TSCA INFORMATION NOW CURRENT THROUGH MAY 20, 2002

Please note that search-term pricing does apply when  
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Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. See HELP  
 PROPERTIES for more information. See STNote 27, Searching Properties  
 in the CAS Registry File, for complete details:  
<http://www.cas.org/ONLINE/STN/STNOTES/stnotes27.pdf>

```
=> s thionyl chloride
      392 THIONYL
      823594 CHLORIDE
L12      137 THIONYL CHLORIDE
          (THIONYL(W) CHLORIDE)
```

=> d scan cn

L12 137 ANSWERS REGISTRY COPYRIGHT 2003 ACS  
IN Cobalt, [2,9,16,23-tetrakis(2,2-dimethylpropoxy)-29H,31H-  
phthalocyaninato(2-)-N29,N30,N31,N32]bis(thionyl chloride-O)-, (OC-6-12)-  
(9Cl)

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):d scan cn  
'D SCAN CN' IS NOT VALID HERE

To display more answers, enter the number of answers you would like to  
see. To end the display, enter "NONE", "N", "0", or "END".  
HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):0

=> s (thionyl chloride)/cn  
L13 1 (THIONYL CHLORIDE)/CN

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	13.46	271.69

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FILE COVERS 1907 - 10 Feb 2003 VOL 138 ISS 7  
FILE LAST UPDATED: 9 Feb 2003 (20030209/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> s l11 and l13  
4643 L13  
L14 3 L11 AND L13

=> d 1-3 cbib pi abs

L14 ANSWER 1 OF 3 CAPLUS COPYRIGHT 2003 ACS

2001:114648 Document No. 134:147613 Regioselective procedure for the production of 4,6-dichloropyrimidine by the chlorination of 4-chloro-6-methoxypyrimidine in the presence of phosphorus compounds using sulfur-containing chlorination agents. Mais, Franz-Josef; Klausener, Alexander; Cramm, Guenther; Steffan, Guido (Bayer A.-G., Germany). Ger. Offen. DE 19938500 A1 20010215, 4 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1999-19938500 19990813.

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 19938500	A1	20010215	DE 1999-19938500	19990813
WO 2001012610	A1	20010222	WO 2000-EP7401	20000731
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
EP 1210337	A1	20020605	EP 2000-948019	20000731
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				

AB 4,6-Dichloropyrimidine is prepared in high yield and selectivity by the chlorination of 4-chloro-6-methoxypyrimidine in the presence of phosphorus compds. R3P:Yn [R = (un)substituted C1-10 alkyl, (un)substituted C6-10 aryl; Y = O, S; n = 0, 1] (e.g., triphenylphosphine oxide) using sulfur-containing chlorination agents (e.g., thionyl chloride).

L14 ANSWER 2 OF 3 CAPLUS COPYRIGHT 2003 ACS

2000:909667 Document No. 134:56686 Procedure for the production of 4,6-dichloropyrimidine by the chlorination of 4-chloro-6-hydroxypyrimidine with acid chlorides. Mais, Franz-Josef; Cramm, Guenther; Klausener, Alexander; Steffan, Guido (Bayer A.-G., Germany). Ger. Offen. DE 19929353 A1 20001228, 4 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1999-19929353 19990626.

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 19929353	A1	20001228	DE 1999-19929353	19990626
	WO 2001000591	A2	20010104	WO 2000-EP5416	20000613
	WO 2001000591	A3	20010525		
	W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
	RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			
	EP 1196393	A2	20020417	EP 2000-942058	20000613
	R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, MC, PT, IE, SI, LT, LV, FI, RO			
	JP 2003503392	T2	20030128	JP 2001-507001	20000613
AB	4,6-Dichloropyrimidine is prepared in high yield and selectivity by the chlorination of 4-chloro-6-hydroxypyrimidine with an acid chloride (e.g., POCl <sub>3</sub> ).				



L14 ANSWER 3 OF 3 CAPLUS COPYRIGHT 2003 ACS

2000:909665 Document No. 134:56684 Procedure for the production of 4,6-dichloropyrimidine by the chlorination of 4-chloro-6-methoxypyrimidine with acid chlorides in the presence of hydrogen halides. Mais, Franz-Josef; Cramm, Guenther; Klausener, Alexander; Steffan, Guido (Bayer A.-G., Germany). Ger. Offen. DE 19929350 A1 20001228, 4 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1999-19929350 19990626.

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 19929350	A1	20001228	DE 1999-19929350	19990626
WO 2001000592	A1	20010104	WO 2000-EP5400	20000613
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
EP 1194412	A1	20020410	EP 2000-938784	20000613
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2003503393	T2	20030128	JP 2001-507002	20000613
US 6441170	B1	20020827	US 2001-19092	20011219

AB 4,6-Dichloropyrimidine is prepared in high yield and selectivity by the chlorination of 4-chloro-6-methoxypyrimidine with an acid chloride such as PCl<sub>3</sub>, POCl<sub>3</sub>, PCl<sub>5</sub>, RPCl<sub>2</sub> [R = (un)substituted C<sub>6</sub>-10 aryl, (un)substituted C<sub>1</sub>-10 alkyl], RPOCl<sub>2</sub>, R<sub>1</sub>COCl [R<sub>1</sub> = Cl, (un)substituted C<sub>1</sub>-10 alkoxy, (un)substituted C<sub>6</sub>-10 aryloxy, (un)substituted C<sub>5</sub>-11 heteroaryloxy, OCl<sub>3</sub>, COCl], or SOCl<sub>2</sub> in the presence of a hydrogen halide (e.g., HCl).

=> logoff

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LOGOFF? (Y)/N/HOLD:.

COST IN U.S. DOLLARS

SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

8.08

279.77

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)

SINCE FILE

TOTAL

ENTRY

SESSION

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General Characteristics	Health Hazards	Material Recommendations
A colorless, nonflammable and liquified gas with an odor similar to moist hay.	A simple asphyxiant.	Dry Gas: Stainless steel, copper and brass - Moist Gas: Monel
TLV-TWA	Flammable Limits	DOT Class / Label
0.1 ppm	Nonflammable	2.3 / Poison Gas
Molecular Weight	Specific Gravity	Specific Volume
98.9	3.48 @ 77° F	3.8 cu.ft./lb @ 70° F
CGA Valve Outlet	CAS Registry No.	UN Number
660	75-44-5	1076

**National Stock Number (NSN)**  
**Applicable to Phosgene**

**MIL Specs/ Fed Specs**  
**MSDS for Phosgene**

Grade Part #	Purity Minimum	Cylinder Size	Volume LBS	Pressure @ 70 F	Comments
Chemically Pure 471800	99% Min. Liquid Phase	044 007 003 002	95 10 5 1	10.7 10.7 10.7 10.7	None

**Uses:** Phosgene - COCl<sub>2</sub> is used in organic synthesis, in manufacture of dyes, pharmaceuticals, herbicides, insecticides, synthetic foams, resins, and polymers. Phosgene is a lung irritant and extremely toxic. It is also produced in the presence of refrigerants that are drawn through a heat source, refrigeration technicians should take extreme caution and prevent the exposure by making sure that smoking is avoided in the presence of refrigerants and preventing inhalation of the gas when soldering or brazing.

Also called CARBONYL CHLORIDE, a colourless, chemically reactive, highly toxic gas having an odour like that of musty hay, used in making organic chemicals, dyestuffs, polycarbonate resins, and isocyanates for making polyurethane resins. It first came into prominence during World War I, when it was used, either alone or mixed with chlorine, against troops. Inhalation causes severe lung injury, the full effects appearing several hours after exposure.

First prepared in 1811, phosgene is manufactured by the reaction of carbon monoxide and chlorine in the presence of a catalyst. It can be formed by the thermal decomposition of chlorinated hydrocarbons; e.g., when carbon tetrachloride (q.v.) is used as a fire extinguisher. Gaseous phosgene, which has a density about three and one-half times that of air, liquefies at a temperature of 8.2° C (46.8° F); it is usually stored and transported as the liquid under pressure in steel cylinders or as a solution in toluene. With water, phosgene reacts to form carbon dioxide and hydrochloric acid.

Last Updated: 98 AUG 10